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A COMMUNITY MATURITY MODEL: AN APPLICATION FOR ASSESSING KNOWLEDGE SHARING IN THE FIELD

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Abstract

Knowledge is considered as a strategic resource in the current economic age. Strategies, practices and tools for enhancing Knowledge Management (KM) became one important issue for organizations. Despite the demonstrated role of communities in sharing, capturing and creating knowledge, the literature is still missing instruments for assessing their maturity. Even if several knowledge-oriented maturity models are provided at the enterprise level, few are focusing on communities as a mechanism for organizations to manage knowledge. This paper proposes a new Community Maturity Model (CoMM) that was developed through a Design Science perspective to assess members' participation and collaboration and the KM capacity of a community; and to identify its needs, to ensure its development and sustainability according to its mission, degree of formalization, developmental stages, means, etc. This CoMM is intended to be sufficiently generic to be applied to any type of communities and useable by practitioners for conducting self-assessments. KM experts were involved in all stages of the maturity model's development in order to maximize the resulting model's relevance and practical applicability. The model was piloted and subsequently applied within a Chief Knowledge Officers (CKO) professional association, as a community, to assess especially knowledge sharing among its members. The present work tries to respond to the research question on how to determine community evaluation basing on a KM perspective. This paper reports on the first field application and evaluation of the initial version of the CoMM.

Keywords: Knowledge Community, Community of Practice, Maturity Model, Knowledge Management, Knowledge Sharing, Knowledge Capital, Information Capital, Chief Knowledge Officer.

1 INTRODUCTION

Community-based KM approach has become one of the most effective instruments to manage knowledge within organizations (Brown & Duguid, 1991; Wenger & Synder, 2000). Indeed, Wenger (1998) argues that knowledge could be shared, organized, and created within and among communities. He posits that Communities of Practice (CoPs) are the company's most versatile and dynamic knowledge resource. They form the basis of an organization's ability to know and learn. Hildreth et al. (2000) consider KM and CoPs like inseparable, and support that these latters offer the key to making up the gap of some technologically based KM methods. From practical and theoretical perspectives, one can find several types of communities (of Practice (CoP), of Interest (CoIN), of project…). For instance, Virtual (VCoP) or Social online Communities (SoC) (such as Open Source communities) are considered as an attractive alternative to disseminate personal tacit knowledge, create value and promote innovative solutions (Rheingold, 1993; Hagel & Armstrong, 1997). Furthermore since they deal mostly with knowledge, Correa et al. (2001) consider them as Knowledge Communities (KC) that are an organization's strategic resource to manage knowledge through socialization (Earl, 2001; Nonaka & Takeuchi, 1995).

Nowadays, due to the increasing use of communities in the professional context and the exponential growth of social online communities, it is more than ever important today for modern organizations to assess the quality of their outcomes, and to understand their role in intra- and inter-organizational KM settings. To establish such an understanding, many questions need to be answered, including but not limited to: How to determine the type of a community? How to determinate the maturity level of a community from a KM perspective? Can we define a prescriptive instrument for assessing communities and providing them recommendations to improve their performance and the quality of outcomes, and so make their organizational use optimal? Therefore, it is clear today that organizations urgently need guidance on those issues and on how to take advantage from the KCs' production and to efficiently use and manage them for better sharing, learning and innovating.

Several scholars have proposed models and approaches to assess communities (Chu et al., 2007; Lesser & Storck, 2001; Verburg & Andriessen, 2006; McDermott, 2002). Few efforts have been reported on using maturity models to assess communities especially from a cognitive (KM) point of view. Most of the KM models proposed in the literature (such as GKMMM (Global Knowledge Management Maturity Model, Pee et al., 2006), KMAP (Knowledge Management Assessment Project, Gallagher & Altalib, 2008), MGKM (Model for General Knowledge Management within the Enterprise, Grundstein, 2008), and KNM (Knowledge Navigator Model, Hsieh et al, 2009)) are either very generic at the enterprise organizational level and/or not enough specific to assess communities. Very few community-oriented KM maturity models have been proposed (Gongla & Rizzuto, 2001; Lee et al., 2010). Even if these examples of models present an interesting theoretical perspective, little is reported on their application and evaluation. They are not specifically KM oriented and most of them focus only on CoPs. The current paper is an attempt to address this gap and to propose a new model for assessing communities from KM perspective sufficiently generic to be applied to any community or network.

This paper reports on the initial version of the CoMM and the associated method to apply it. This model is developed in cooperation with a Focus Group consisting of professional KM experts and subsequently applied within a CKO professional association (as a inter organizational community), to assess especially knowledge sharing among its members, in order to provide evidence of proof of value and proof of use in the field. The CoMM is intended to be useable by practitioners for conducting self-assessments. The purpose of the paper is further to serve as a starting point for future research in this area.

The remainder of this paper is structured as follows. We first present the theoretical background related to maturity models. Next, we introduce our research approach to develop the CoMM, based on a Design Science perspective. Then, we report on the first application and evaluation of the CoMM

within a CKO professional association. Last, we present the implications for research and practice, followed by our conclusion which summarizes the limitations of this research and present future research directions.

2 BACKGROUND

The word maturity is derived from Latin word *maturitas*, from *matures* (Oxford dictionary), equivalent to "ripeness" which means having reached the most advanced stage in a process. Maturity is a quality or state of becoming mature (Andersen et al., 2003). Paulk et al. (1993 p.21) define process maturity as "*the extent to which a specific process is explicitly defined, managed, measured, controlled, and effective*". It describes the transition from an initial to a more advanced state, possibly through a number of intermediate states (Fraser et al., 2002). Maturity models reflect the degree to which key processes or activities are defined, managed, measured, and executed effectively. They position all the features of an activity on a scale of performance under the fundamental assumption of ensuring plausible correlation between performance scale and maturity levels. A higher level of maturity will lead to a higher performance. They typically describe the characteristics of an activity at a number of different levels of performance (Fraser et al., 2003).

2.1 Maturity models

Approaches to determine process or capability maturity are increasingly applied to various aspects of product development, both as an assessment instrument and as part of an improvement framework (Dooley et al., 2001). Most maturity models define an organization's typical behavior for several key processes or activities at various levels of 'maturity' (Fraser et al., 2003). Maturity models provide an instantaneous snapshot of a situation and a framework for defining and prioritizing improvement measures. The key strengths of maturity models include:

- They are simple to use and often require simple quantitative analysis;
- They can be applied from both functional and cross-functional perspectives;
- They provide opportunities for consensus and team building around a common language and a shared understanding and perception;
- They can be performed by external auditors or through self-assessment.

One of the earliest maturity models is Crosby's Quality Management Maturity Grid (QMMG) (Crosby, 1979), which was developed to evaluate the status and evolution of a firm's approach to quality management. Subsequently, other maturity models have been proposed for a range of activities including quality assurance (Crosby, 1979), software development (Paulk et al., 1993), supplier relationships (Macbeth & Ferguson, 1994), innovation (Chiesa et al., 1996), product design (Fraser et al., 2001), R&D effectiveness (McGrath, 1996), product reliability (Sander & Brombacher, 2000), and KM (Hsieh et al., 2009). One of the best-known maturity models is the Capability Maturity Model (CMM) for software engineering (based on the Process Maturity Framework of Watts Humphrey, quoted in Paulk et al., 1993), developed at the Software Engineering Institute (SEI). Unlike the other maturity models, CMM is a more extensive framework in which each maturity level contains a number of key process areas (KPAs) containing common features and key practices to achieve stated goals. A number of studies of the software CMM have shown links between maturity and software quality (e.g. Harter et al., 2000). This model (with multiple variations) is widely used in the software industry.

2.2 Knowledge-oriented Maturity Models

The interest in KM dates back to the early 90s when companies realized the strategic value of knowledge as a competitive resource and a factor of stability for their survival (Spender, 1996). There is more than one definition of KM. Mentzas (2004 p.116) defines KM as the "*discipline of enabling individuals, teams and entire organizations to collectively and systematically create, share and apply*

knowledge, to better achieve the business objectives". KM generally refers to how organizations create, retain, and share knowledge (Argote, 1999; Huber, 1991). It involves the panoply of procedures and techniques used to get the most from an organization's tacit and codified know and know-how (Teece, 2000). According to McDermott (2000), *tacit knowledge is the real gold in knowledge management and communities of practice are the key to unlocking this hidden treasure*.

Recently, a number of maturity models related to KM have been proposed. The Global Knowledge Management Maturity Model (GKMMM, Pee et al., 2006) is descriptive and normative. It describes the important characteristics of an organization's KM maturity level and offers Key Performance Areas (KPA) that characterize the ideal types of behavior that would be expected in an organization implementing KM. The Knowledge Management Assessment Project (KMAP, Gallagher & Altalib, 2008) is based on the qualitative GKMMM (Pee et al., 2006) and Q-Assess developed by Science Applications International Corporation (SAIC). Q-Assess represented 12 sub-assessments to assess levels of maturity across three KPAs: People, processes and technology. This model allows assessing working groups and it highlights weaknesses and gives recommendations to deal with them. The Model for General Knowledge Management within the Enterprise (MGKME, Grundstein, 2008) is composed of two levels; the underlying level, and the operating level. Under each category, many key issues are focused and addressed in the assessment process. They consist of managerial guiding principles, ad hoc infrastructures, generic KM processes, organizational learning processes, and methods and supporting tools. The Knowledge Navigator Model (KNM, Hsieh et al, 2009) is developed in order to navigate the KM implementation journey. This maturity model consists in two frameworks namely: evaluation framework and calculation framework. The evaluation framework addresses three management targets which are: Culture, KM process and Information Technology. The calculation framework is characterized by a four step algorithm model.

Each of the above maturity models deals with KM evaluation within organization; thus it correlates maturity levels only with KM evolution stages and don't deal with many characteristics of communities: Common values, sense of identity, history, etc. These models are not intended to assess communities in an informal mode in intra or inter organizational setting, even less in a holistic manner from a KM perspective. They address, more specifically, a formal project mode context in intra organizational setting. Many of these models are descriptive and normative (e.g. GKMMM, MGKME), they don't prescribe or present any action to perform in order to address weaknesses revealed by the model.

Name	**GKMMM**	**KMAP**	**MGKME**	**KNM**	**CEM**	**Lee et al. MM**	**CoMM**
Reference	(Pee et al., 2006)	(Gallagher & Altalib, 2008)	(Grundstein, 2008)	(Hsieh et al, 2009)	(Gongla & Rizzuto, 2001)	(Lee et al., 2010)	Current paper
Results focus	Descriptive	Prescriptive	Descriptive	Descriptive	Descriptive	Prescriptive	Prescriptive
Goal	Intra organizational KM assessment	Intra organizational KM assessment	Intra organizational KM assessment	Intra organizational KM assessment	Intra organizational CoP assessment	Intra organizational CoP assessment	Intra and cross organizational community assessment
	Enterprise	Enterprise	Enterprise	Enterprise	CoP	CoP	Any community
Work	Formal	Formal Project	Formal	Formal	Informal	Informal	Formal project

Mode	Project mode	mode	Project mode	Project mode	community mode	community mode	mode and informal community mode
Assessment focus	KM evolution stages (inspired from CMM)	KM evolution stages (inspired from CMM and based on GKMMM)	Underlying and operating levels (derived from the Nonaka & Takeuchi's SECI model)	Evaluation and calculation frameworks (inspired from CMM and other KM maturity models)	Community Evolution stages (Community life cycle)	Community Evolution stages (Community life cycle) basing on a set of Critical Success Factors	Holistically (fitting with communities' characteristics and stages)

Table 1. Comparison of CoMM with other Maturity Models

Very few maturity models related to communities have been proposed. First, Gongla & Rizzuto (2001) Community Evolution Model (CEM) proposes five main stages as community maturity levels, which are potential, building, engaged, active and adaptive. For each of these stages, they defined fundamental functions and used three perspectives in order to describe the characteristics of every maturity stage. These perspectives are the behavior of people, degree and type of process support, and types of technology encountered at each stage. Second, Lee et al. (2010) Maturity Model presents four stages of maturity (building, growth, adaptive and close). This model gives a snapshot of the current community maturity level basing on a set of Critical Success Factors, analyzes the stage and proposes a guide for improving the CoP.

These maturity models are not all knowledge-oriented per say. Most are inspired from the five staged CMM model without trying to focus on the originality of communities and to develop a maturity model that fit exactly with them. These models aim to assess communities in an intra organizational context under a set of characteristics related to maturity stages. Furthermore, basing on these models we cannot differentiate a community from a social network or even a project team. Moreover, these models may not be generalized on different type of communities since they focused, mainly, on CoPs.

2.3 The design and criteria of the Community Maturity Model

In the literature, Wenger (1998) defines CoP as a group of people who share a concern, a set of problems or a passion about a topic and who deepen their knowledge and expertise in this area by interacting on an ongoing basis. It is distinguished by three essential characteristics: a joint enterprise, a mutual commitment and shared repository/capital (Wenger & Snyder, 2000; Wenger et al., 2002). In one hand and in the broadest sense, Correa et al. (2001) consider any community as a KC where members share knowledge (tacit or explicit) around an interest, a practice or a project activity. In the other hand, Cummings (2003) posits that knowledge sharing is the means by which an organization obtains access to its own and other organizations' knowledge. In the case of these communities, Bresman et al. (1999) argued that individuals will only participate willingly in knowledge sharing once they share a sense of identity (or belonging) with others. This sense of identity is one of several key factors to reach maturity for a community. In the context of this research, we define **Community Maturity as a community's maximum capability to manage knowledge where community members actively interact/participate and effectively collaborate, reach mutual commitment**

based on a well shared capital, and adjust their efforts and behaviors in fulfilling the community' mission by producing high quality outcomes.

The main objective of the study reported in this paper is to present the blueprint for a new Community Maturity Model based on the literature which addresses some of the limitations described above. This prescriptive model is sufficiently generic to be applied to all types of communities and networks. It aimed to assess the KM maturity of a given community holistically. Further, it supports the development of recommendations to improve performance and the quality of outcomes.

The CoMM was developed during a design science study in which we cooperated with a Focus Group experts included 12 CKOs working for different companies of different sizes, in different sectors. The participants held at least a master-level degree, from different areas. They had at least 10-15 years of work experience, with 58% of them having 5-9 years as a CKO. The average age of the CKOs was 44 year old. 75% were male. They were accustomed to meet in the context of a business association to share their best practices regarding methods, techniques and tools in the KM area.

The development of the CoMM took more than one year (between January 2007 and March 2008). The Focus Group process consisted of three-hour long monthly meetings. Seven meetings were used to work on the CoMM artifacts, three meetings for participants' feedbacks on pilot studies, and three hosted external thematic presentations related to maturity models and community-based KM approach from professional and research perspectives. The Focus Group meetings were facilitated by one of the researchers. The participants expressed the following critical requirements for the CoMM:

- **Resource efficient:** The CoMM should be fast to complete.
- **Rich data:** The CoMM should report on different points of view and concerns from the workplace, using both quantitative and qualitative data.
- **Limited need for further advanced data analysis:** The supporting tool should provide integrated support for the interpretation of the results.
- **Self-assessment:** Practitioners should be able to apply the CoMM themselves.
- **Constructive learning:** The CoMM should promote community consolidation and organizational learning rather than control.

After a series of meetings with the Focus Group in which several initial versions of the CoMM were presented and pilot results were shared, the first full version of CoMM was completed through a well-structured facilitation process. The CoMM consisted of a number of artifacts including: The CoMM structure that describes the community characteristics (areas of concerns or topics) and their related criteria; The CoMM questionnaire that includes questions, levels of rating and mathematical equations for analysis; The CoMM method that (a) defines the steps and provides guidance on how to run the CoMM questionnaire in the field, and (b) supports the development of recommendations; and the CoMM tool which is a customized MS Excel application that represents the implementation of the above artifacts, and enables the execution of a concrete assessment by enabling the collection and analysis of quantitatively and qualitatively questionnaire data. It provides different presentations of results (e.g. individual and team spider diagrams, comparison curves, and cloud matrices) and the results' report generation.

The CoMM distinguishes between four maturity levels: Ad-hoc, Exploring, Managing and Optimizing. At the **Ad-hoc level**, the community is emerging (but not yet as such) and so immature to effectively manage knowledge (**emergence stage**). Members have many difficulties to interact/participate and effectively collaborate, reach mutual commitment based on a shared capital, and adjust their efforts and behaviors in fulfilling the community' mission by producing high quality outcomes. At the **Exploring level**, the community is at the **structuring stage** and members are well aware of their weaknesses in terms of maturity to manage knowledge. Members try to build mutual commitment based on a shared capital, but are faced with many challenges. Some initiatives to address these are attempted but without major impacts. At the **Managing level**, the maturity of the community is quite good (**maturation stage**) but there still is room for improvement. In general, members have a

quite good sense of community and are able to produce good quality outcomes. At the **Optimizing level**, the community is mature to manage (and even to create) knowledge and very well structured (**consolidation or norming stage**). Members perform/operate together optimally and are able to accomplish high quality outcomes.

Unlike the other maturity models discussed earlier, CoMM explores the maturity of a given community holistically from a KM perspective related to its basic characteristics. The following areas of concerns (inspired mostly from Wenger, 1998), were considered essential by the participants in the Focus Group meetings to analyze the maturity of a community:

- ***Joint enterprise***: All that makes of a community an autonomous entity: practices, missions/objectives, interests, etc;
- ***Mutual commitment***: Mutual aid relationship among members that is necessary for knowledge sharing (Cramton, 2001). It is also the realization of actions to maintain coherence which is necessary within a KC;
- ***Shared capital***: It is the whole of informational capital created, retained, shared by the community, and which allows its members to create new knowledge starting through interaction, participation and collaboration;
- ***Collaborative work***: Collaborative tasks/activities and processes carried out by members within the community in the goal to share their knowledge (experiments, know-how, best practices…). It is also methods and technologies that support them.

Areas of concern	**Criteria**
Joint enterprise	1. Legitimacy 2. Mission 3. Common areas of interest 4. Knowledge creation (production)
Mutual commitment	5. Admission of members 6. Code of conduct 7. Motivation 8. Level of participation 9. Mutual trust
Shared capital	10. History 11. Common repository 12. Information capital 13. Common values 14. Sense of identity
Collaborative work	15. Communication 16. Animation, facilitation and coordination 17. Cooperation and collaboration 18. Knowledge and Collaboration technologies

Table 2. CoMM areas of concerns and criteria

For each area of concern, a number of criteria were defined (see Table 2). These criteria represent the topics for a questionnaire (CoMM questionnaire). Each criterion is represented by an item that is evaluated on a 4-level scale. To support the respondents, the levels of each criterion are described briefly, with examples wherever possible. An example of a criterion item is provided in Figure 3. Respondents are allowed to provide scores such as “0.5”, “1.5”, “2.5”, and “3.5”. When a respondent cannot answer, no score is recorded. The more the criteria are rated at 4 by respondents, the higher the maturity of community is (optimized level).

JOINT ENTERPRISE
Mission
What is the nature of the community' mission?
Level 1 Undefined
The community has not clearly identified mission.
Level 2 Blur
Each member within the community defines its own missions, according to his/her perception of the community objectives
Level 3 Clear
The community defines itself its missions collectively.
Level 4 Precise
The missions are in line with a predefined framework/strategy.
Score (from 1 to 4)

Figure 1. Example of criterion in CoMM.

In essence, the CoMM is structured as a library of criteria. Sometimes, not all criteria are relevant. So, the evaluators can decide which criteria fit better with a particular context. They can also decide to expand the set of criteria. Also, for some contexts certain criteria may be more important than others. In such situations, it is possible to assign different weights to the criteria.

3 METHOD

The CoMM was developed following Hevner et al.'s (2004) Design Science, a constructivist approach. In this paper we do not report on the development of the CoMM but only on its first application in the field to evaluate and demonstrate the model's practical feasibility and utility. This research, is still in progress, therefore answers Hevner et al.'s Design Evaluation Framework recommendation for the use observational methods (2004 p. 86). Our role as researchers in this CoMM application has consisted to the organization and execution of (group) interviews, the analysis of collected interview data, and the gathering of participants' feedback regarding CoMM. Our interventions during this application were only aimed at supporting the association in achieving its goals in the project. The researchers had no personal stake in the project, neither with the problem situation nor with the solutions that were to be explored. The primary motivation for the association to involve the researchers was its desire to assess and improve the community of members in a number of its key teams.

Research data was collected from both quantitative and qualitative sources to enable a rich understanding of the application of the CoMM in practice. First, while observing the different activities in the study, we kept notes of incidents, remarks and events that conveyed critical information. Second, the (group) interview results were analyzed to gain insight into (1) the participants' reaction and understanding of the interview questions, and (2) analyze specific feedback regarding the CoMM. Finally, we invited participants on all levels to share feedback on the CoMM method and artifacts.

4 THE APPLICATION OF COMM: A FIELD STUDY WITHIN A CKO PROFESSIONAL ASSOCIATION

As we mentioned above, the CoMM was developed in cooperation with KM experts from a French KM association. This non-profit industrial association of CKOs was founded more than ten years ago. This association functions by thematic workgroups which work on topics identified like crucial for KM: Economic aspects, change management, human resource and competence management, business intelligence, collaboration, innovation, communities and social networks, etc. Each workgroup, leaded and facilitated by a chair, produces deliverables which are integrated into the association knowledge capital to be shared by all the members through an Intranet platform (shared space), reports, multimedia CD-ROMs, trainings, etc. Particular and specific events allow gathering all the members for more informal exchanges.

This association is considered first, by players and environment, as a CoP in the KM field since all the developed topics are in the KM field, and second, as a KC since its main objective is to share and produce knowledge among members. The CoMM is one of its future deliverables. It is developed in the framework of the communities and social networks workgroup. The executive president of the association was interested to apply the CoMM within the association itself, as a first field evaluation, among all members and workgroups to assess whether the association is an efficient KC or not, able to help members and organizations to share knowledge (e.g. best practices); and to see how to improve association management and quality of outcomes.

4.1 Field application steps

The field application followed the CoMM method steps. It was performed between April and May 2008. It was applied and followed the CoMM method steps:

Figure 2. The seven steps in the CoMM method.

As presented to members, the objectives of the CoMM analysis were to check:

- If the association had all the required characteristics to be qualified as a KC.
- If the association had adequate capabilities and means to effectively support high quality KM actions, at least good knowledge sharing.
- If the operation and management (animation) of the association are well made.
- If members are well interacting, participating and collaborating. If they have a real shared capital.
- If collaboration technologies provided were well selected and effectively used.

All members of the association, 58 persons in total (39 CKOs, 11 CKO surrogates and 8 KM consultants) from different organizations, were asked to participate to this field application. Sixteen individual interviews and six collective interviews (seven persons each) were conducted face-to-face in French. Next, two collective interviews were conducted to examine perception gaps on some criteria. Each interview lasted about 90 minutes. During the interviews the CoMM tool was used for data collection. All interviews were recorded for further qualitative data analysis if needed. After the quantitative (through CoMM Excel application), qualitative (on some specific statements), and cross data (mainly on knowledge sharing capabilities) analyses, a first report was sent to the respondents to solicit any corrections before the final report was prepared. A final presentation to the association board was scheduled in February 2009 to report on the results and provide recommendations in form a list of suggested future actions. The final report was posted to all the members.

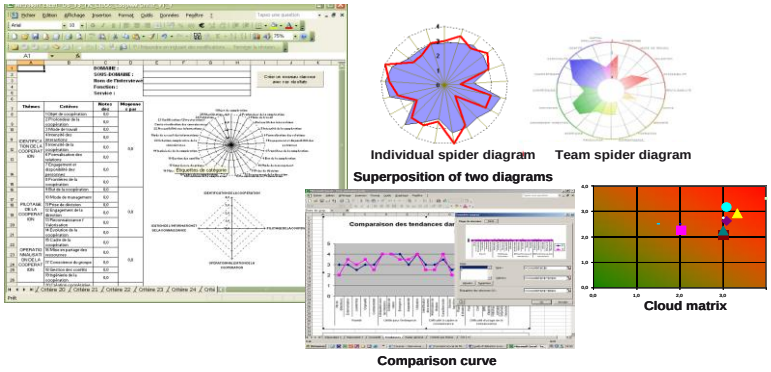

Figure 3. The CoMM tool data collection and analysis

4.2 Findings

The findings were reported as a discussion of the different perceptions related to the CoMM criteria and topics. Findings reported to the association members according to the four CoMM areas of concern include:

- ***Joint enterprise:*** We found similar perceptions about legitimacy of the community, its mission, common areas of interest among members, and different perceptions regarding knowledge creation. Indeed, the members' seniority impacts positively their perception of this criterion.
- ***Mutual commitment:*** We noticed different perceptions between new members and old members regarding admission of members. This relies few years ago on cooptation; today it is rather on a simple statement. There is almost a consensus on mutual trust that governs the association, only some exceptions related to the consultant profile.
- ***Shared capital:*** We found different perceptions on common repository. Even if sharing is one of the most important key elements of the KC, members do not care to share information and knowledge optimally. However, they have the same understanding of concepts, and believe on the existence of valuable information capital held by the association.
- ***Collaborative work:*** We noticed different perceptions among members on the community animation and the degree of use of collaboration technologies from workgroup to another. This depends on the generation to which each one belongs. The older generation is more familiar with face-to-face meetings, which are expensive and difficult to organize. Facilitation skills in face-to-face situations are different from virtual situations.

Through the qualitative data analysis (in this case limited to a fast reviewing of respondents' statements), we found some concerns among members about the involvement of consultants in the association. They are sometimes perceived as "lurkers" or opportunists, i.e. people who take much than they give/share. Turnover among the members is quite common. However, a core is already formed few years ago. For certain, association activities are more beneficial for former members. In what is shared, we can find different types of information and knowledge. Some are very interesting and others not at all. Knowledge sharing can be further improved and optimized.

The general findings reported can be summarized as follows:

- The KM association is a real KC very useful to share best practices between members and organizations. Many means are proposed for that: monthly face to face workgroups meetings, meeting minutes, a shared intranet platform, workgroup based organization and deliverables, publications (3 books and 2 CD-ROMs), internal and external training, annual seminar, etc.
- From the outside, this association seems closed on itself especially to Small and Medium Enterprises (SMEs). Membership fees are high.
- The association is quite enough mature to share knowledge (best practices, guidelines, tools…). Sharing rules and levels are not sufficiently formalized.
- The maturity level of this association was between the Exploring level and the Managing one. The association has reached the structuring stage.
- Knowledge sharing was considered well enough from the internal viewpoint to the association and less good from the outside viewpoint.
- The involvement of researchers is very appreciated by practitioners.

In the final report various recommendations were proposed, including:

1. Giving a new name to the association for highlighting the openness of its structure (e.g. network or community) and offering three levels of participation: for everyone interested by the KM field as a community/network (3^{rd} level) and for members who pay their membership fees as a club (2^{nd} level) with a hard core of board and active members (1^{st} level).

2. Creating a scientific board for the association bringing together some VIPs (from the world of academia and businesses), giving it a better image and evaluating its progress and outcomes.
3. Clarifying and better balancing the responsibilities of everyone (board members, facilitators, active members) in the functioning of the association.
4. Assessing annually the performance and outcomes of each workgroup.
5. Using more Web 2.0 technologies to enhance interaction, participation and knowledge sharing among people within and outside the association, e.g. by using wikis, blogs, RSS, social networks, etc.
6. Expanding the activities of the association to become a reference in the KM field and a place of socialization for all players: referencing books, white papers, curriculums, services and providers, funding, tools, surveys…; making the bridge between research and business and facilitating partnerships; participating in scientific events such as conferences, and publishing results such as case studies with the assistance of researchers both in French and English.

After one year, three of the suggested recommendations were followed up with concrete actions:

- The third recommendation was clearly mentioned in the priorities of the executive board. Tasks and responsibilities were assigned to each board member and the role of the facilitator was more clarified and formalized. A scale of confidentiality has been created based on access rights and the level of participation of members.
- Following the fourth recommendation, a new system of workgroup assessment was introduced to check annually the outcomes of each workgroup.
- Following the fifth recommendation, a blog for the association was created and a KMpedia project was launched (a specific online wikipedia for the KM field).
- Following the sixth recommendation, the association with other academic partners, have created a new scientific conference on KM.

5 DISCUSSION AND IMPLICATIONS

During the application of the CoMM among this field study, we gathered various experiences and feedback regarding the appropriateness and usefulness of CoMM. According to the respondents, the CoMM analysis was interesting and correctly represented their perceptions. It focused on real issues and allowed traditionally 'unspoken issues' to surface. They were also satisfied with the feedback provided to the executive board and the subsequent actions that were taken related to the assessment's recommendations. According to the workgroup facilitators, the results were relevant. According to the board members, the study was satisfactory in terms of results and recommendations, as they confirmed and reinforced some of their own perceptions. This allowed them, for example, to focus more on the functioning of the association and participation of members.

We also received feedbacks and recommendations from the respondents on the CoMM questionnaire such as the possibility to review some criteria and questions. The respondents stated that some criteria were a little bit difficult to understand. Also, the nuances between levels of responses were sometimes subjective or difficult to distinguish. In addition, they proposed to add some criteria such as, practice diversity related to the generational diversity, and to rename some areas of concern such as 'in-house collaboration' instead of 'collaborative work'. Finally, they suggested putting a stronger focus on collaboration and social media rather than on knowledge and collaboration technologies. Interestingly, this was complementary to the suggestions expressed by the focus group. However, since the CoMM is developed as a library of criteria, the review of the CoMM structure according to a specific context is possible and therefore the respondents' suggestions can be easily accommodated. In terms of execution, most respondents expressed that they preferred the use of collective rather than individual interviews as this would enable a faster application of the CoMM process.

Based on the experiences and feedbacks from this field study, we make the following observations regarding the extent to which CoMM meets its initial critical requirements:

- Resource efficient: CoMM appears to be resource efficient. A total of 58 hours were spent: 2 hours for the assessment preparation, 36 hours for the interviews (member profile), 3 hours for the board member profile and 17 hours for the analysis and report preparation. We feel that this is comparatively modest and reasonable effort in terms of resources spent.
- Rich data: The combined use of quantitative and qualitative (even if very limited here) data analysis resulted in richer finding. We felt that qualitative observations enabled us to better uncover and interpret the various points of views expressed by the respondents through the CoMM questionnaire.
- Limited need for further advanced data analysis: The analysis needs in the field application were limited and the CoMM tool provided sufficient support (among others the report generation).
- Self-assessment: The CKOs expressed confidence that they could perform future applications of the CoMM themselves within their organizations for own communities.
- Constructive learning: The respondents' feedbacks show that when the CoMM study is carefully communicated, participation can be effective and generate discussions on real problems within the community that further facilitate the acceptance of proposed solutions.

6 CONCLUSION

In this paper, we report on a first field application and evaluation of a new community maturity model, CoMM, to assist in the assessment of communities' performance in sharing knowledge in particular. The CoMM was developed in a prescriptive logic (constructivist approach) to meet a real business need as expressed by 12 CKOs and others experts that are regularly confronted with community production challenges. Our contribution is both theoretical and practical as we propose a model, an application method, a supporting tool, and empirical evidence of their evaluation. Our experience shows that the CoMM can be applied in a resource-efficient fashion and yields results that are useful for organizations.

However, there are limitations related to this work in order to complete the Design Science Evaluation Framework. First, our empirical evidence is based on three pilot studies (not detailed in this paper) but only a single field application. Further field studies have to be executed to expand the evaluation of the CoMM artifacts and to further enhance the CoMM. Particular care will have to be taken to ensure that CoMM can take into account all characteristics of a given community in different settings and stages. Second, at this stage, the CoMM cannot yet be used to investigate a correlation between community maturity levels and organizational performance. However, it provides a first step into this direction.

We recommend several directions for future research to enhance the current version of CoMM. First, the model has to be applied in intra and inter organizational context for different types of communities. The experiences from these applications will assist in the further development and evaluation of the CoMM artifacts. Second, the weighting of criteria, not detailed in this paper, should be further explored and correlated with the four levels of maturity. Third, organizational and community performance measures have to be developed to enable an analysis of the relationship between community maturity and organizational productivity. Fourth, from a Behavioral Science perspective, some further confirmatory studies should be performed using Structural Equation Modeling (Bollen, 1989) to validate the correlation between these variables (i.e. CoMM constructs and performance).

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